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FOREST RESEARCH NOTES

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CALIFORNIA FOREST AND RANGE
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STEPHEN N. WYCKOFF, Director

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FOREST TREE SEED COLLECTION ZONES IN CALIFORNIA

By

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The forests of California are divided in this paper into forest tree seed collection zones. The zones are created for two reasons, the first of which is to insure that stock grown from any lot of seed is planted in an area with an environment comparable to that of the location in which the seed was collected. The great range of types and sites in the forests of California demands that the general principles of seed provenance be observed. The second reason for establishing seed collection zones is to simplify the keeping of records of seed lots. Records of individual seed lots have been maintained from seed collection to outplanting of the stock. These detailed records are of little value without adequate research concerning the performance of any seed lot in a given planting area.

1/ The author acknowledges the use of the vegetation type map of California prepared by the Forest Survey, California Forest and Range Experiment Station, and information furnished by Duncan Dunning of the same Station.

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The question of seed provenance is summarized by Baldwin[2/] and need not be reviewed here in detail. The essence of research and experience in seed provenance is that, except for known superior strains or exotics, the best plantations result from seed collected from an area of comparable environment. This generality is recognized in the statement of the Seed Policy Committee of the United States Department of Agriculture[3/] that it shall be the policy--

> 4. To use local seed from natural stands whenever available unless it has been demonstrated that seed from another specific source produces desirable plants for the locality and uses involved. Local seed means seed from an area subject to similar climatic influences and may usually be considered as that collected within 100 miles of the planting site and differing from it in elevation by less than 1000 feet.
>
> 5. When local seed is not available, to use seed from a region having as near as possible the same length of growing season, the same frequencies of summer drought, with other similar environment so far as possible, and the same latitude.

Strict adherence to this policy involves separate maintenance of individual seed lots from seed collection to outplanting. A simpler method of handling seed is here provided by recognizing seed collection zones based on forest type and site, which are assumed to be the integrated expression of environmental influences.

The forested portion of the vegetation type map of California prepared by the Forest Survey is used as the first subdivision of the state into seed collection zones. Within the broad vegetation classes, further subdivision is based on coniferous tree species composition, on site, and on latitude. A map of the 13 seed collection zones described in the following paragraphs is shown on plate 1. A larger, more detailed map was prepared for field use in 1945 and has been adopted by the Forest Service in California.

2/ Baldwin, Henry I. Forest tree seed of the north temperate regions. 240 pp. Chronica Botanica Company, Waltham, Mass. 1942.

3/ McCall, M. A. Forest tree seed policy of the U. S. Department of Agriculture, Jour. Forestry 37: 820-821. 1939.

The timber stand of the east slope of the Sierra Nevada and of the Columbian plateau of northeastern California, consisting of ponderosa pine and Jeffrey pine with admixtures of Pacific white fir and California incense-cedar, is an obvious broad type. The site is predominantly quality III-125[4/] and lower. A latitudinal division in the vicinity of Lake Tahoe creates two seed zones, which have been called the northern east-side Sierra and the southern east-side Sierra.

The west slope of the Sierra Nevada supports two broad timber types, the mixed conifer and the subalpine. On the lower and middle west slope of the Sierra Nevada and in the southern extension of the Cascade Range the timber stands are typically mixed conifer, containing ponderosa pine, sugar pine, Pacific white fir, and California incense-cedar, with Douglas-fir included in the northern part. In the vicinity of the Mokelumne River Douglas-fir ceases to be an important part of the stand. The Mokelumne River serves to divide the west slope into northern and southern zones.

A belt of high site quality, A-200 and I-175, exists along the lower slopes, ranging in elevation up to about 5,000 feet in the southern Sierra Nevada and up to about 4,000 feet in the northern Sierra Nevada. Above this belt site quality is usually II-150, III-125, and IV-100. The type division at the Mokelumne River and this additional division based on site delineates four zones which are designated: northern west-side Sierra, high site; northern west-side Sierra, low site; southern west-side Sierra, high site; and southern west-side Sierra, low site.

The upper slopes of the Sierra Nevada support a subalpine forest in which California red fir and Jeffrey pine are the only commercial species. A division of the subalpine type latitudinally in the vicinity of Lake Tahoe forms two zones, the northern subalpine, and the southern subalpine.

In southern California the timber stands are confined to rather small areas in discontinuous mountain ranges and are commercially unimportant. Separation on a map on the basis of type or site is impractical; accordingly, the whole area has been called the southern California zone.

The northern Coast Ranges of California support three distinguishable forest types. The redwoods extend along the coast in the fog belt, 10 to 30 miles in width. A break in the type occurs at Cape Mendocino. The redwood belt to the north is of relatively high site and contains as minor species Douglas-fir, western hemlock, Sitka spruce, grand fir, and Port Orford white cedar. South of Cape Mendocino the redwood stands are generally of lower site and contain principally Douglas-fir as a minor species. On this basis the region has been separated into the northern redwood and the southern redwood zones.

4/ For a discussion of site classifications, see "A site classification of the mixed-conifer selection forests of the Sierra Nevada," by Duncan Dunning. Research Note No. 28. California Forest and Range Experiment Station. 1942. (Processed.)

East of the fog belt and extending to lower elevations of the inner Coast Range and of the Klamath Mountains is an area predominantly Douglas-fir. The type, called the Douglas-fir zone, breaks out to the coast in the Cape Mendocino region, separating the redwood region as noted above.

Along the higher portions of the inner Coast Range and of the Klamath Mountains and extending east as far as the upper Sacramento River is a belt of mixed conifer timber of medium site which has been designated as the north coast pine zone. Some limited areas of subalpine type have not been excluded from this zone.

The zones thus established on the basis of forest type and site and on an arbitrary latitudinal division conform fairly well to the areal and altitudinal limitations of the policy quoted. In practice, seed collected in any zone would be labelled with the zone number, and stock grown from that seed would be planted anywhere within that zone. The planting of stock outside its zone, if necessary, should be confined to zones most similar. It is hoped that the zones as proposed will effect a practical application of the theoretically best seed policy and will fulfill the needs of nursery and planting administration.

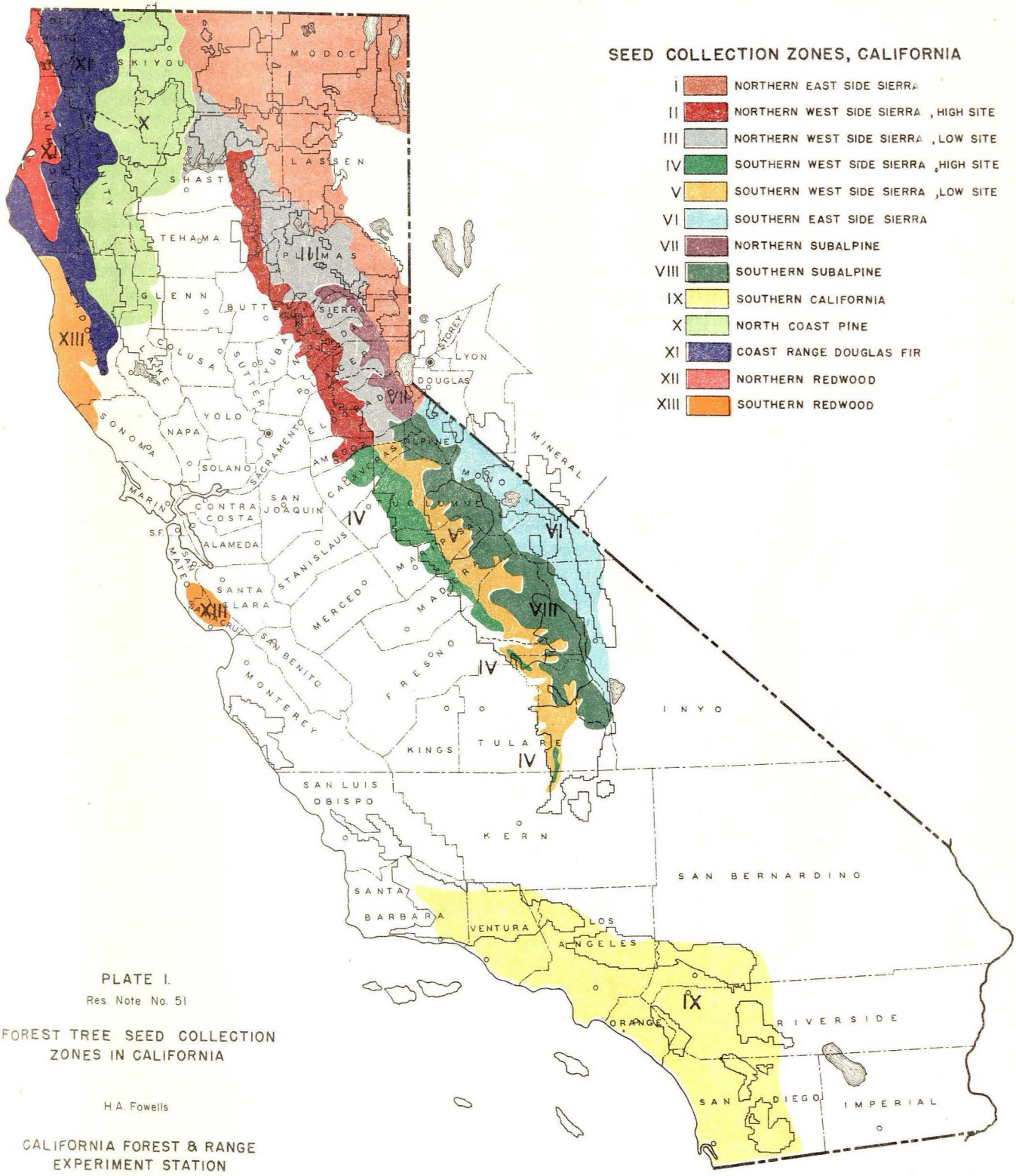

PLATE I.

Res. Note No. 51

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